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(54) PRODUCT DISPENSER AND CARRIER

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(52) **U.S. Cl.** **239/43**

(57) **ABSTRACT**

A product dispenser and carrier (**10, 110, 210, 310, 410, 510**) for attachment to a surface such as a dryer fin includes a plate member (**11, 111, 211, 311, 411, 511**) and a product carrier (**21, 121, 221, 321, 421, 521**). The plate member (**11, 111, 211, 311, 411, 511**) attaches to the surface and the product carrier (**21, 121, 221, 321, 421, 521**) releasably attaches to the plate member (**11, 111, 211, 311, 411, 511**). Product (**31, 131, 431, 531**) is operatively connected to the product carrier (**21, 121, 221, 321, 421, 521**).

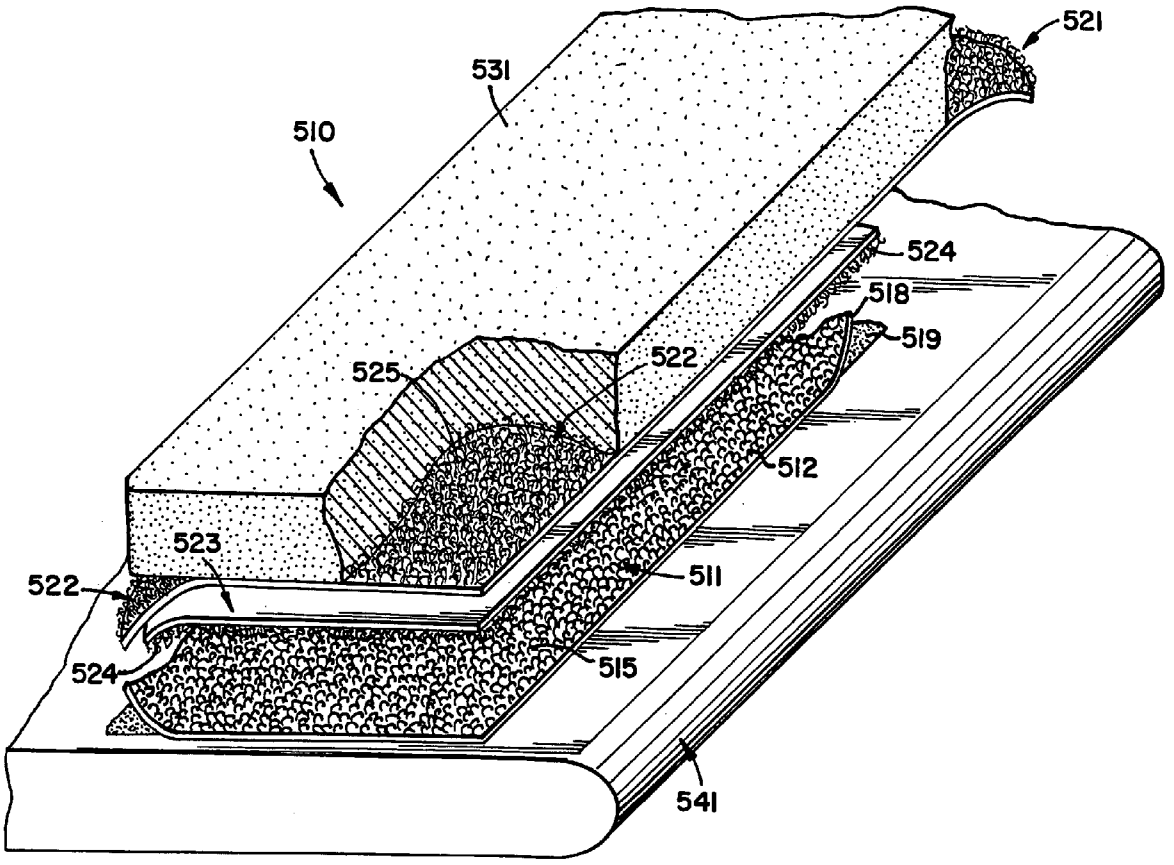
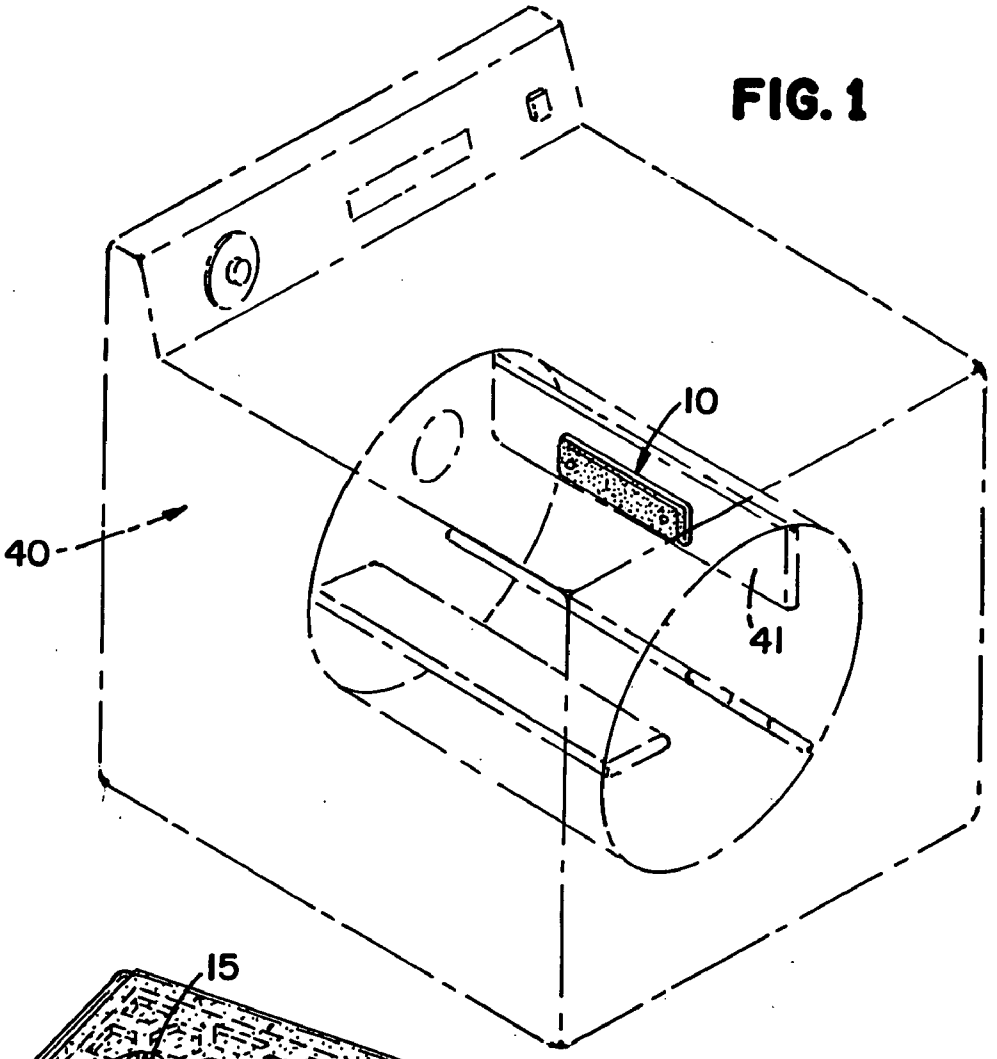


FIG. 1



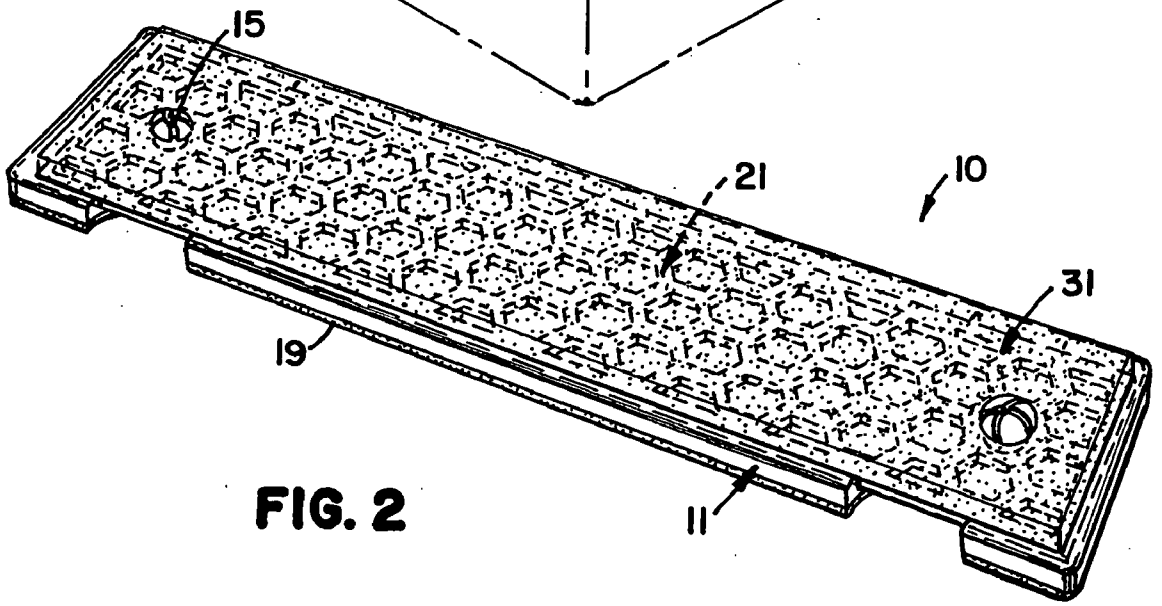


FIG. 2

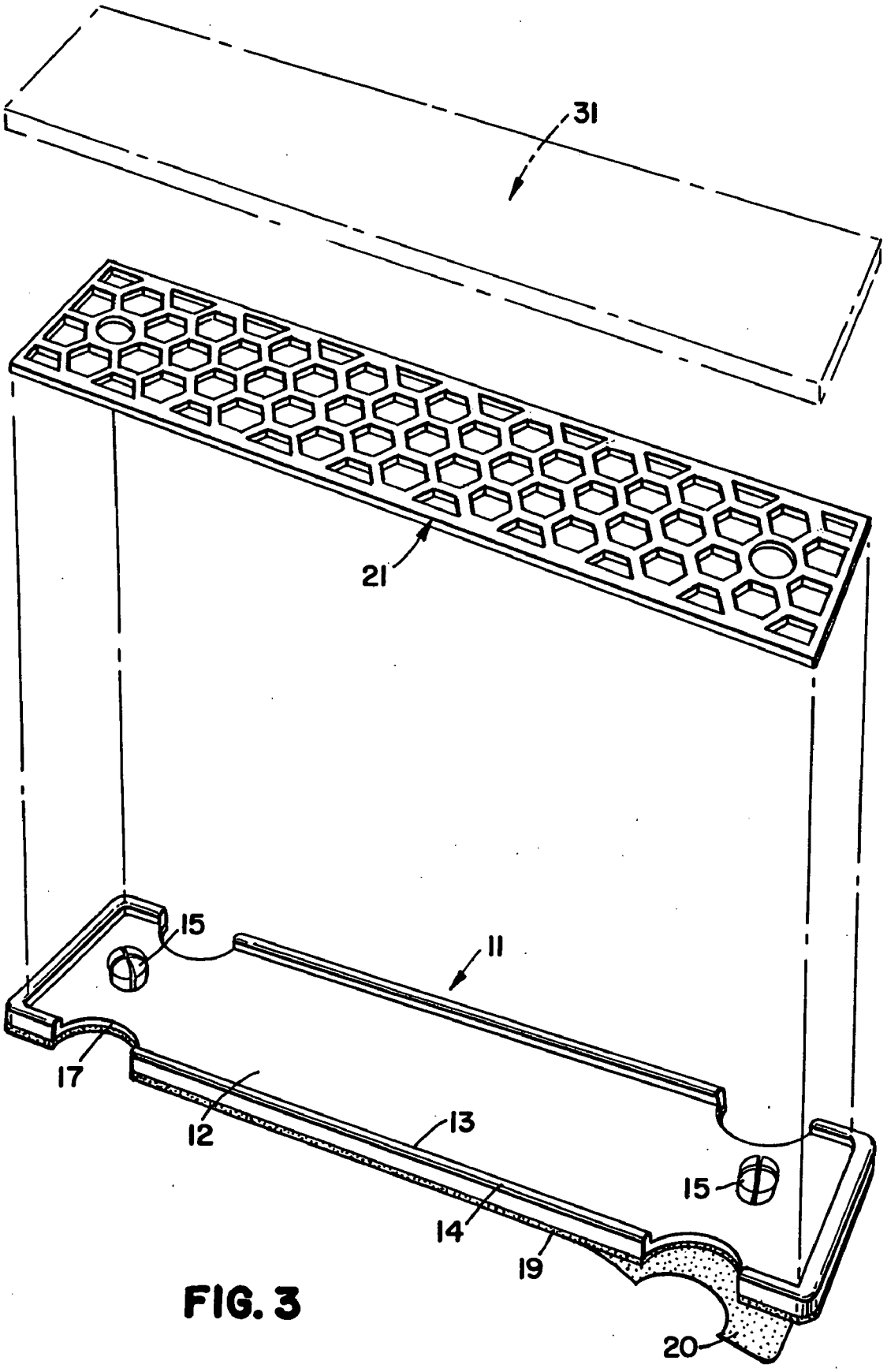


FIG. 3

FIG.4

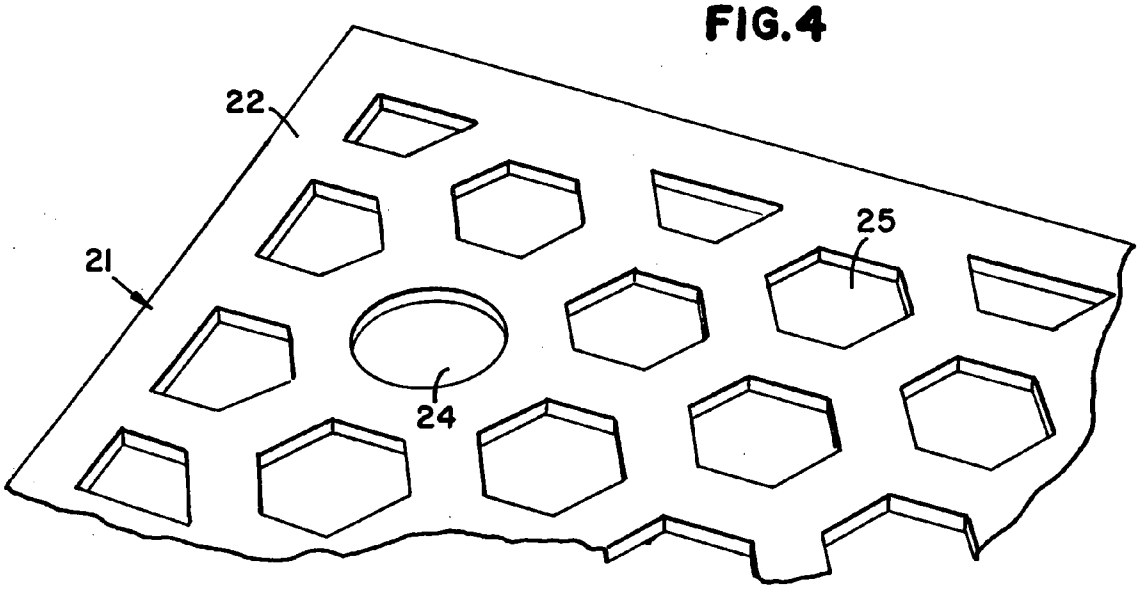


FIG.5

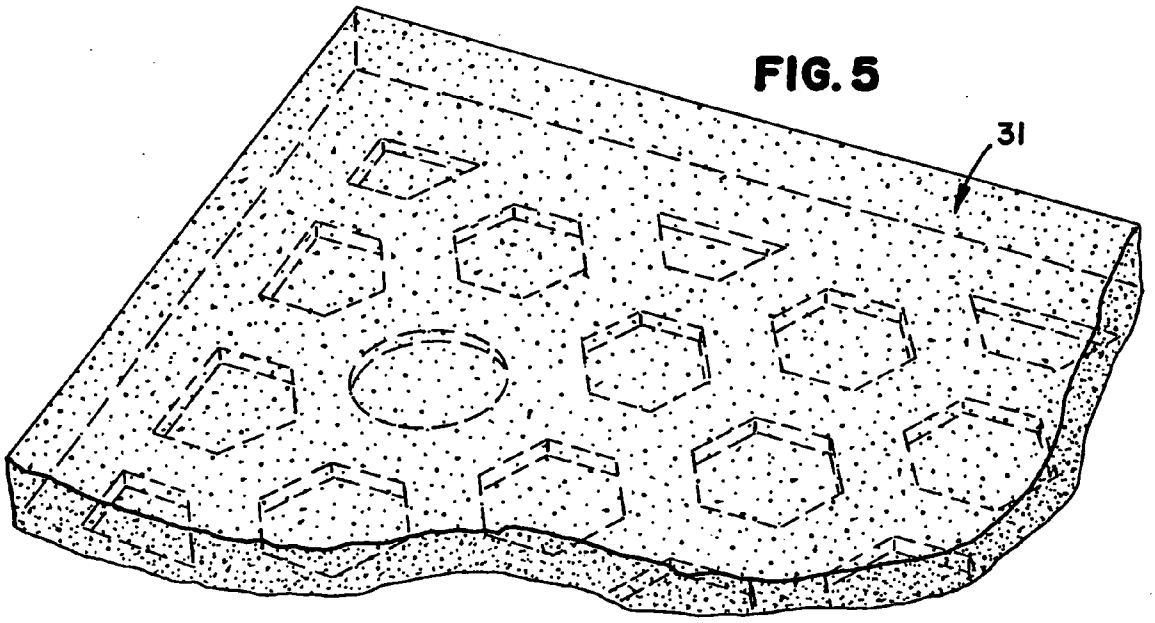
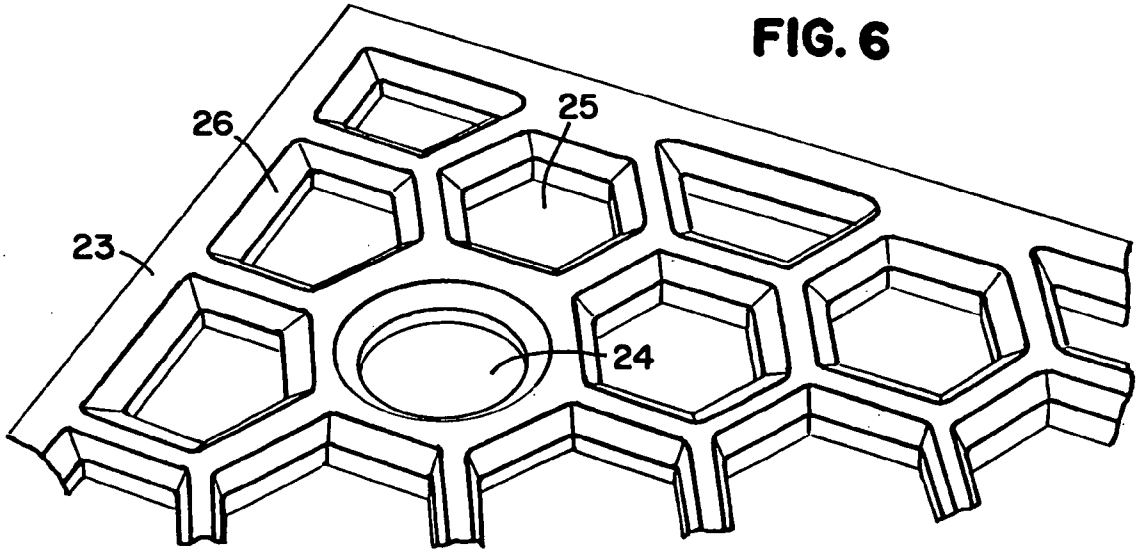


FIG. 6



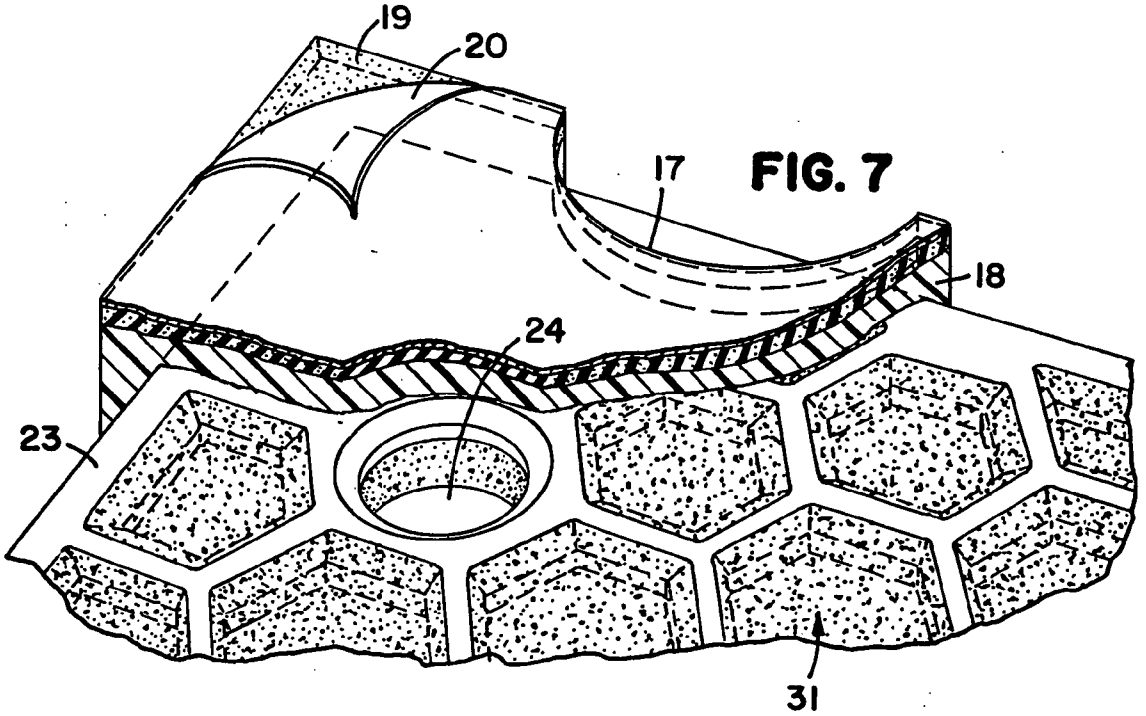
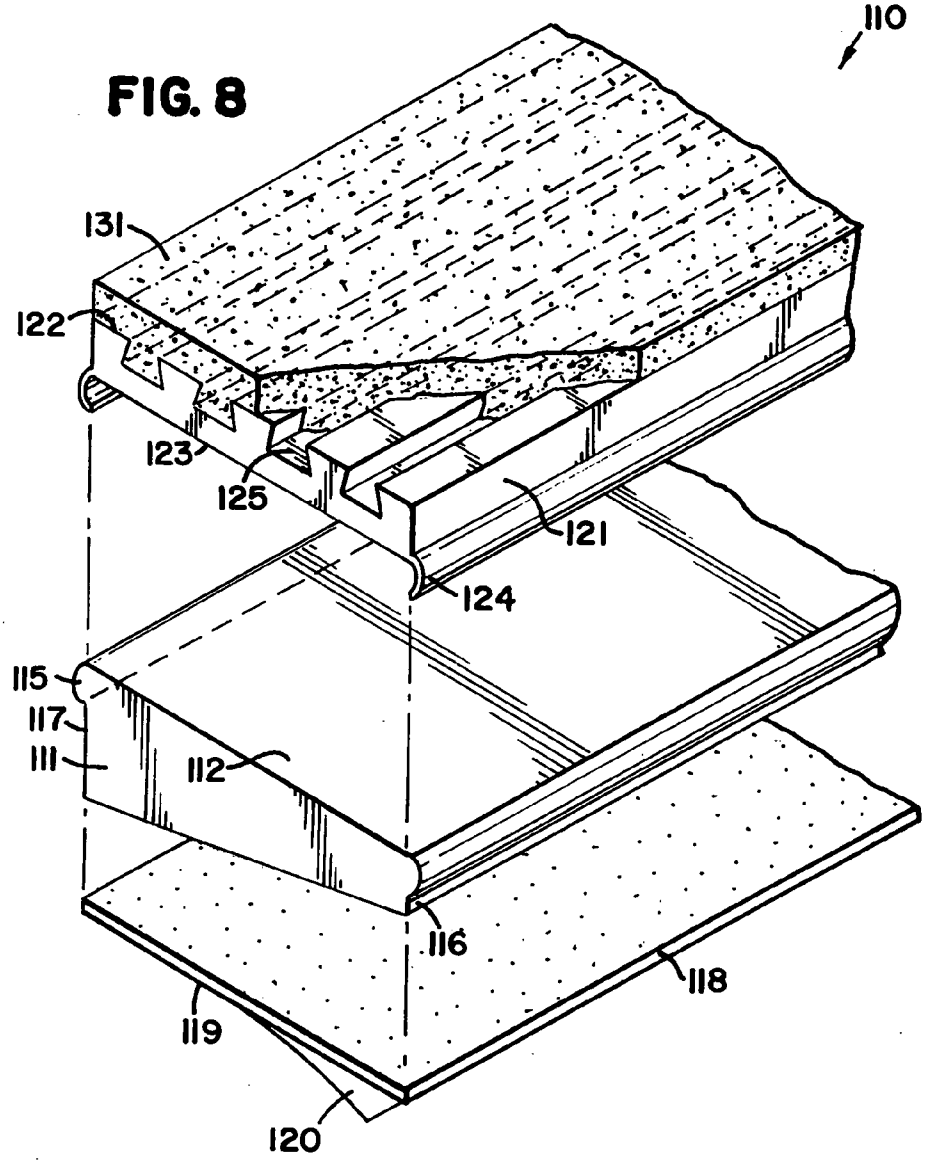


FIG. 7

FIG. 8


110
131
122
123
125
121
124
115
117
111
112
116
118
119
120

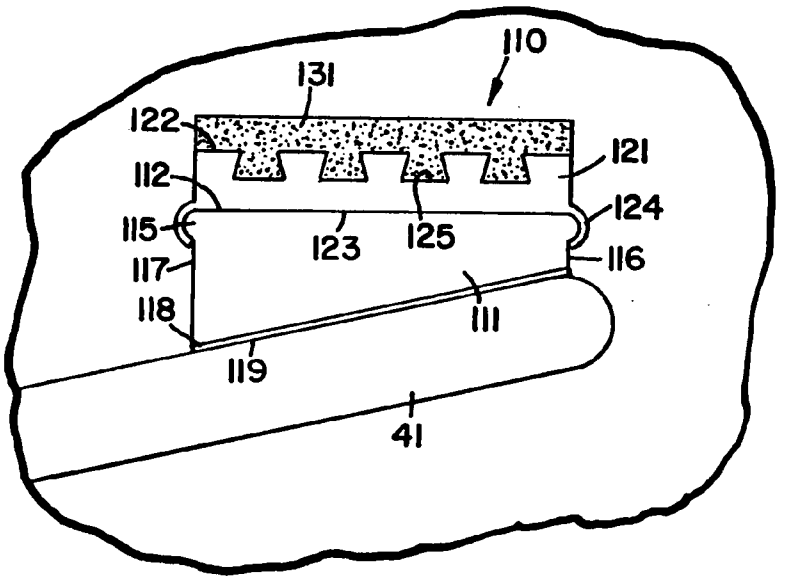

110
131
122
121
112
124
115
123
125
116
117
118
111
119
41

FIG. 9

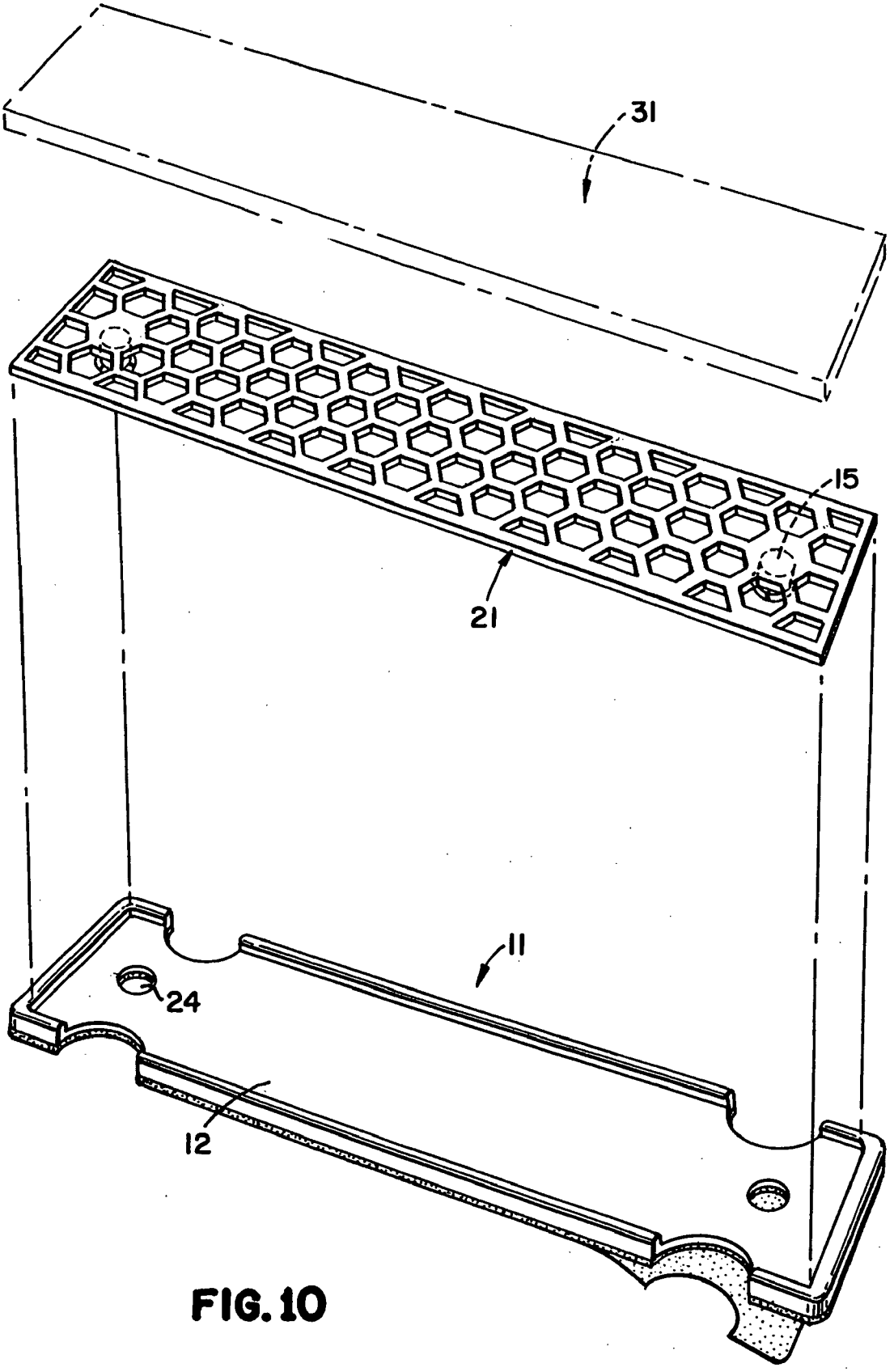


FIG. 10

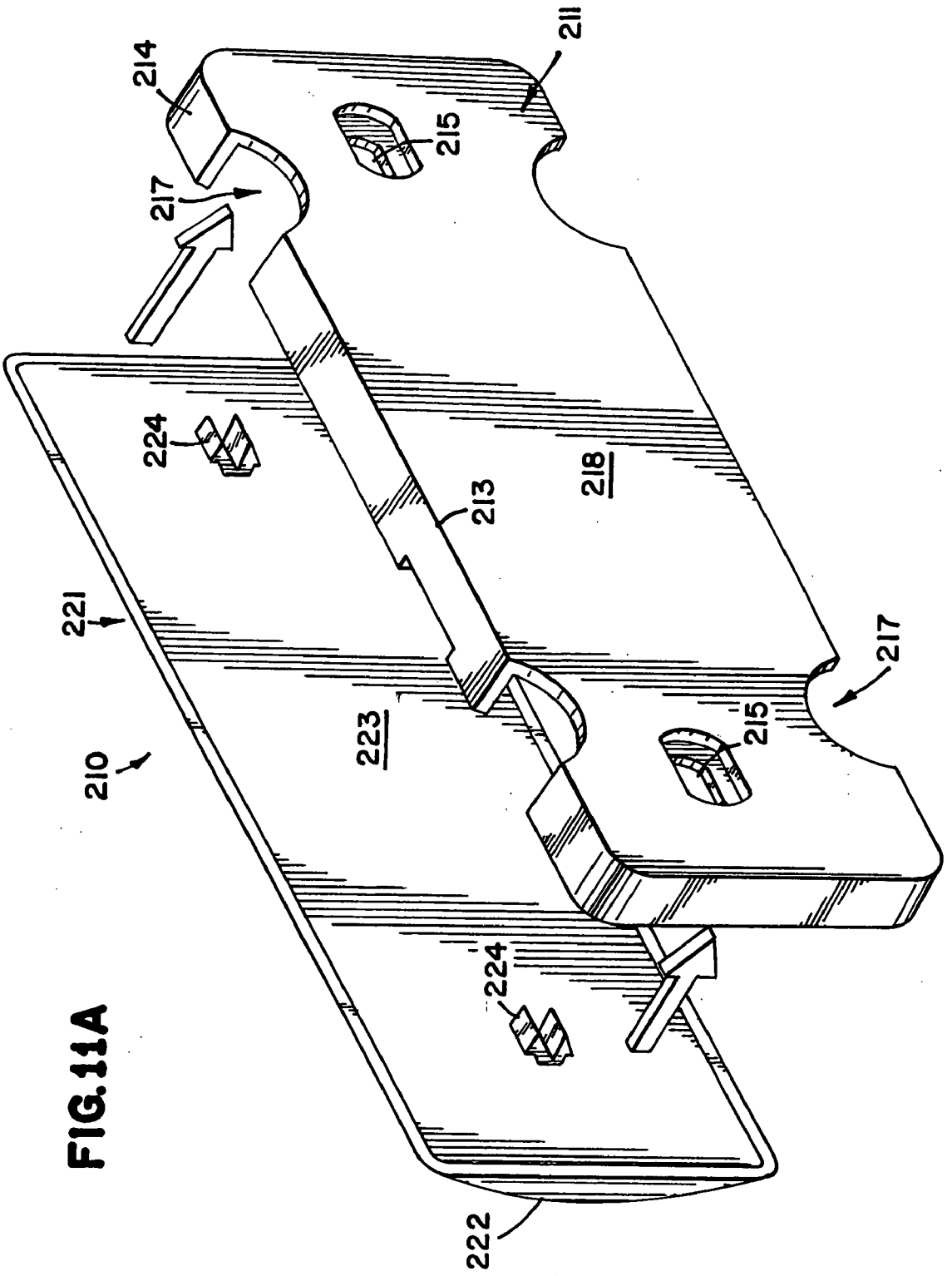
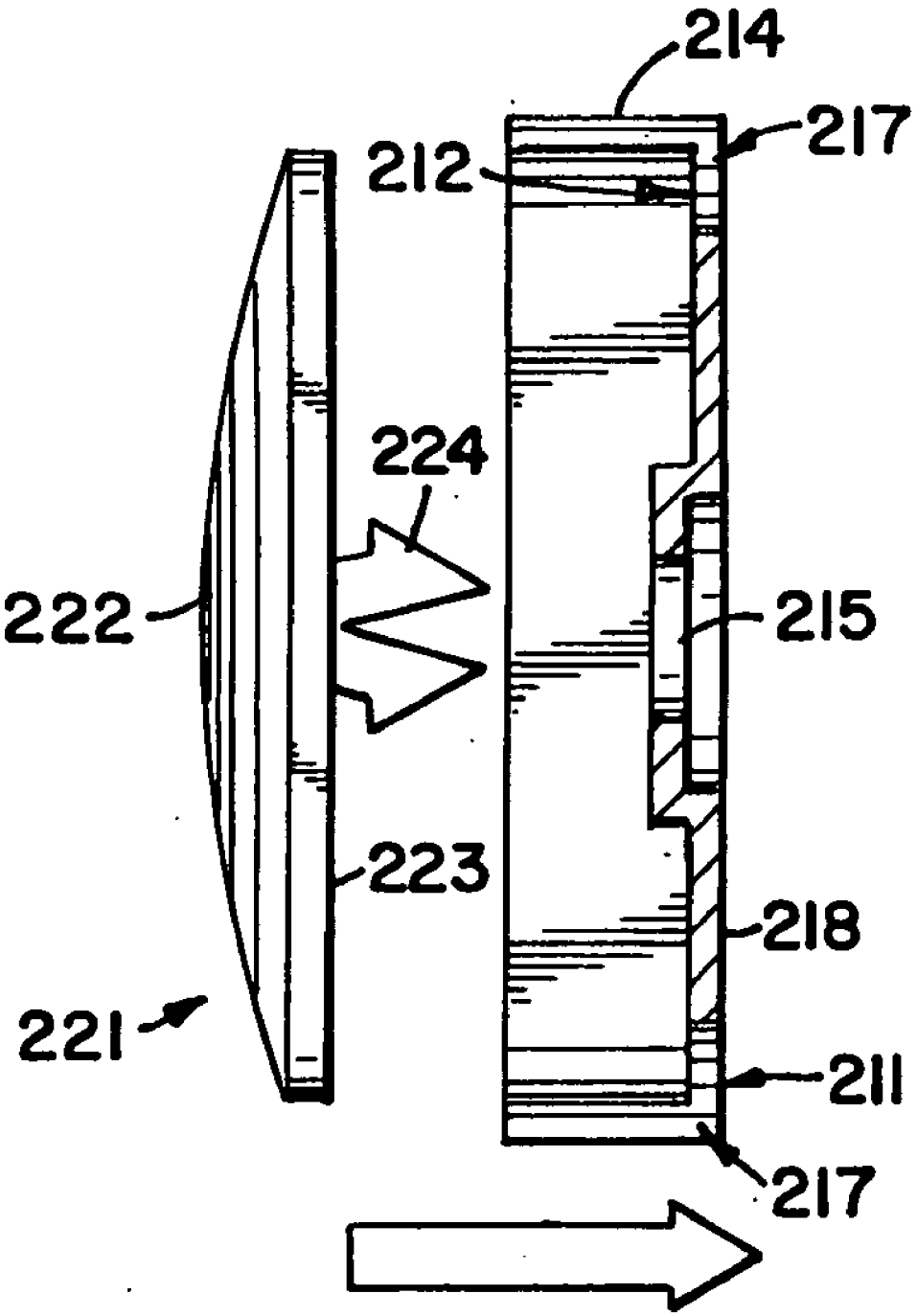


FIG.11A

FIG. 11B



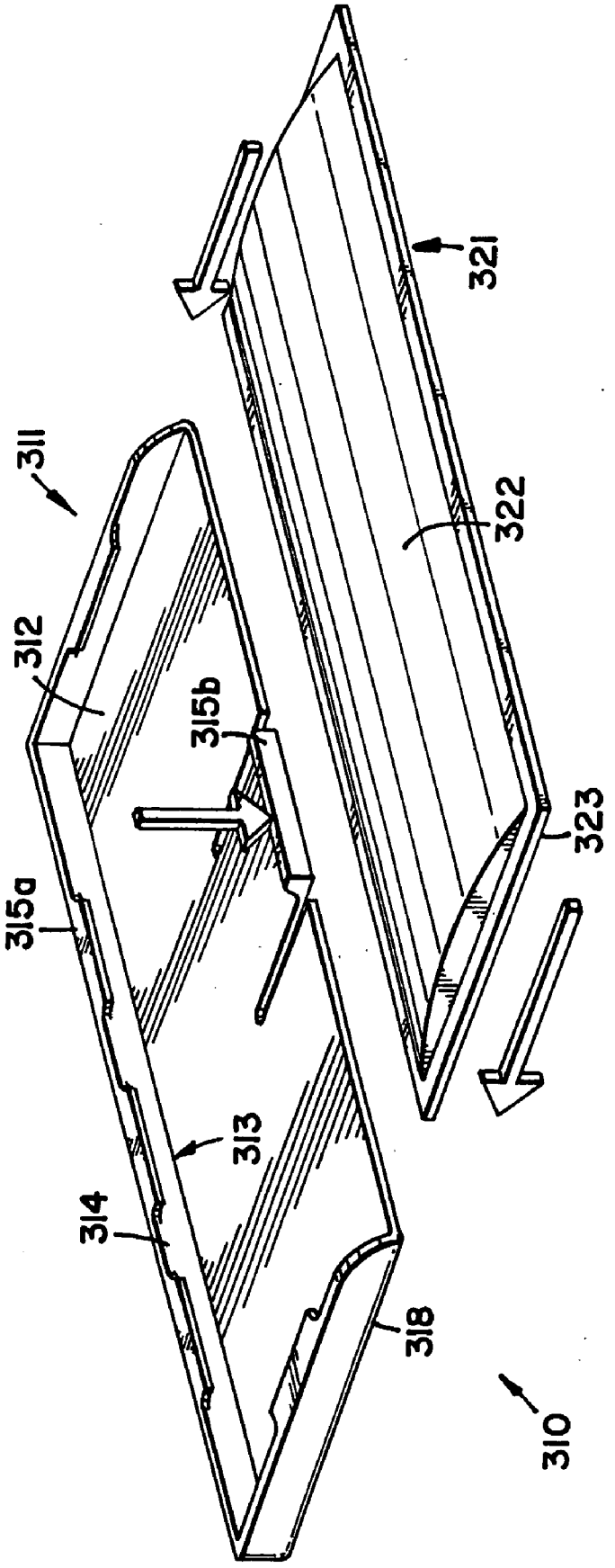


FIG. 12

FIG.13

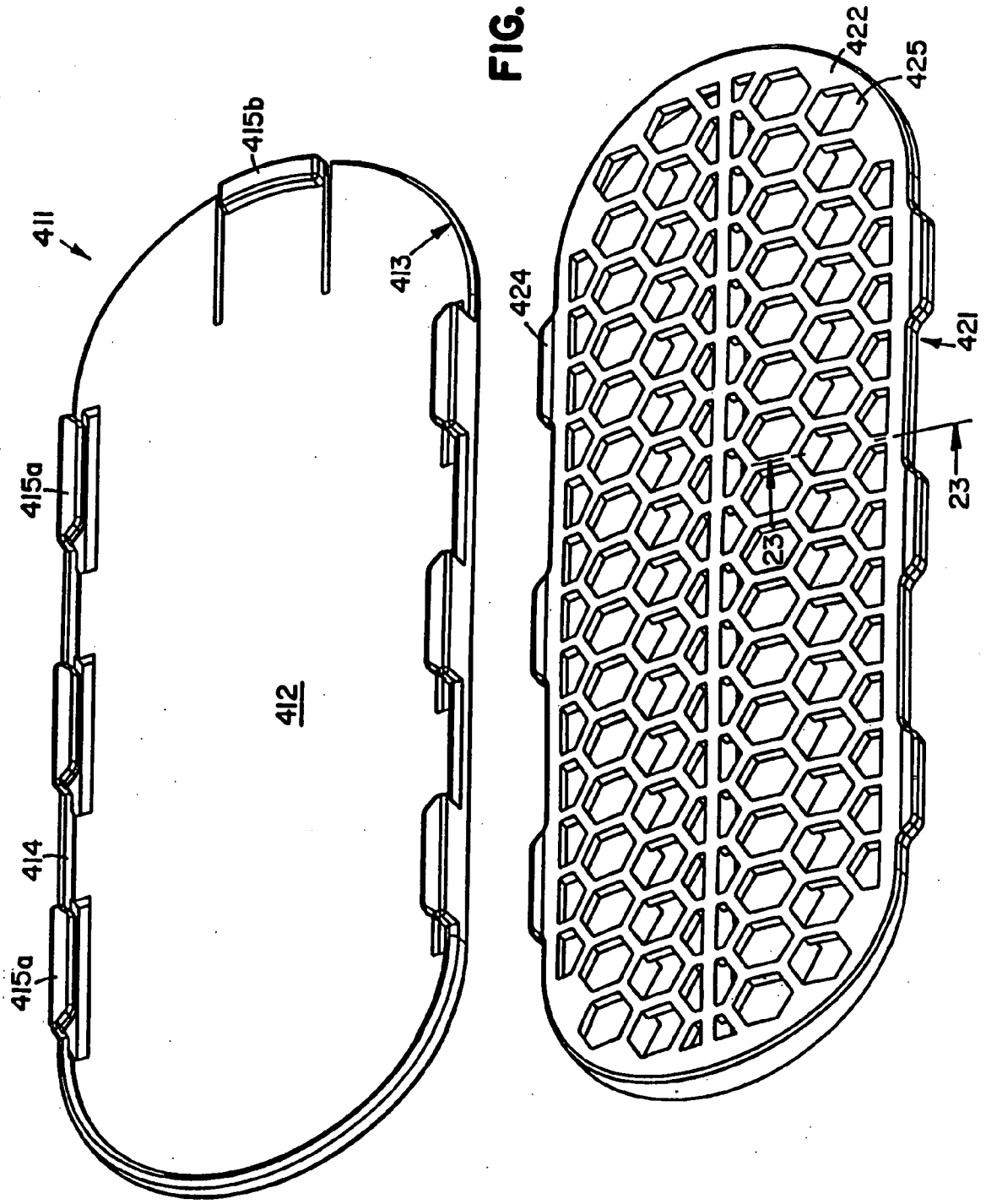
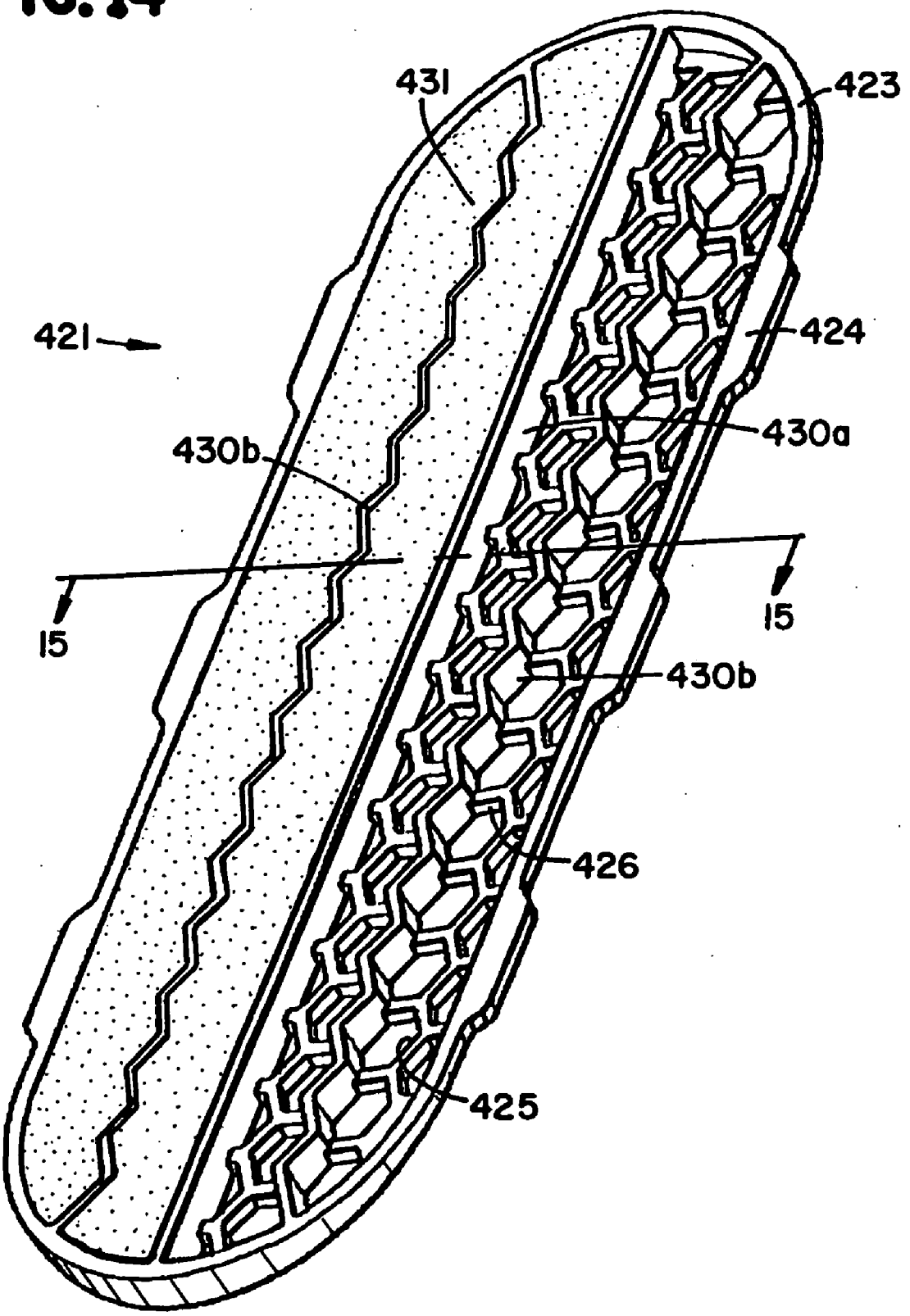


FIG. 14



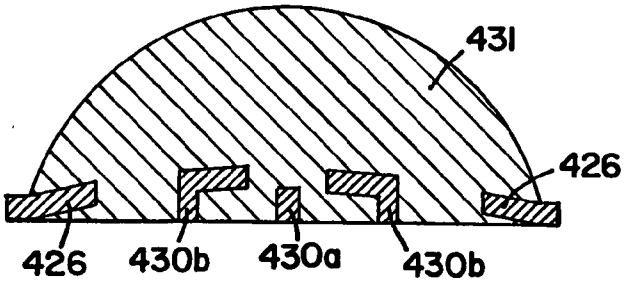


FIG. 15



FIG. 16A



FIG. 16B



FIG. 17A



FIG. 17B



FIG. 18A

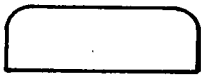


FIG. 18B

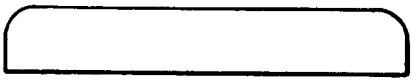


FIG. 19A



FIG. 19B

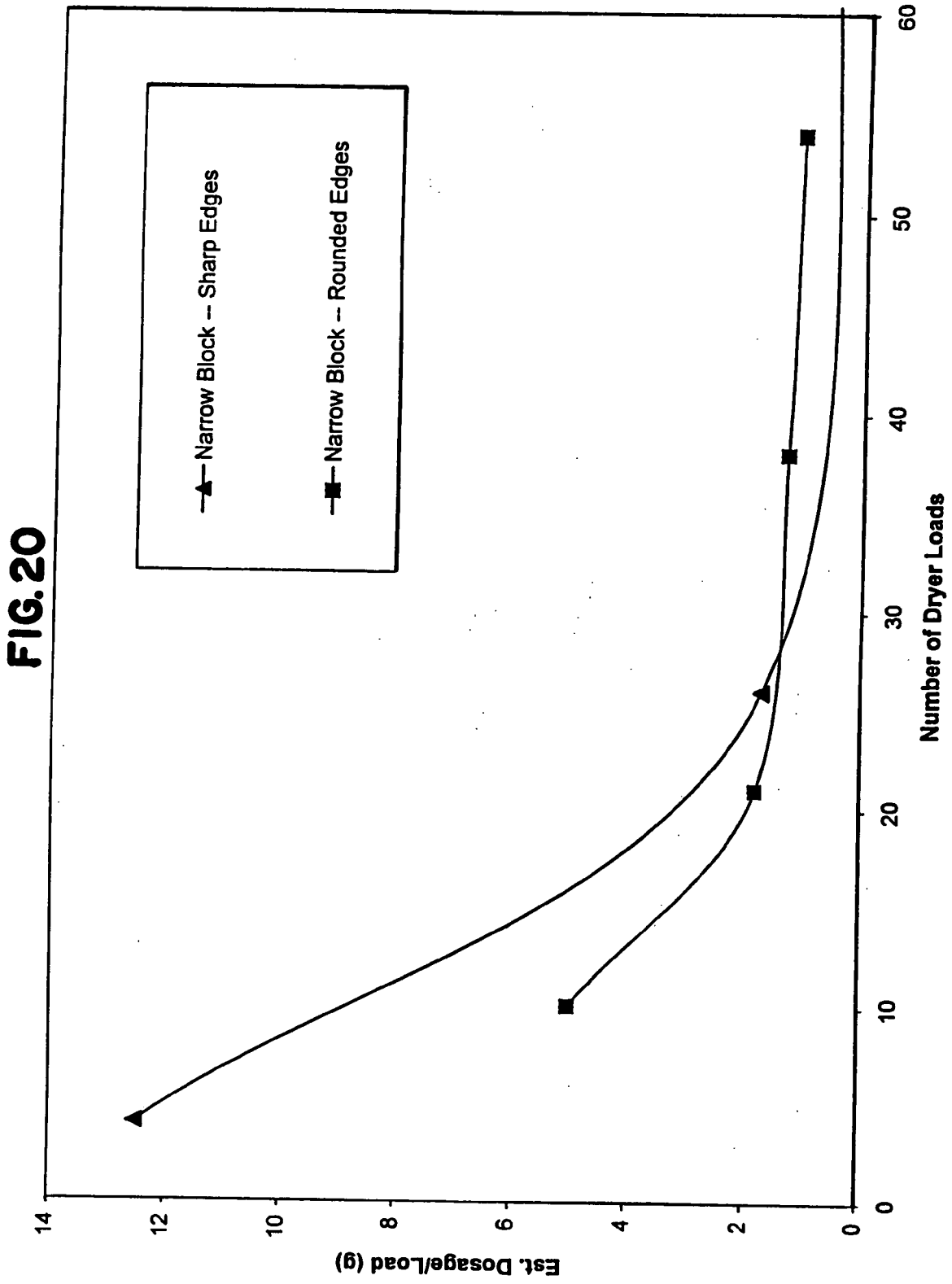
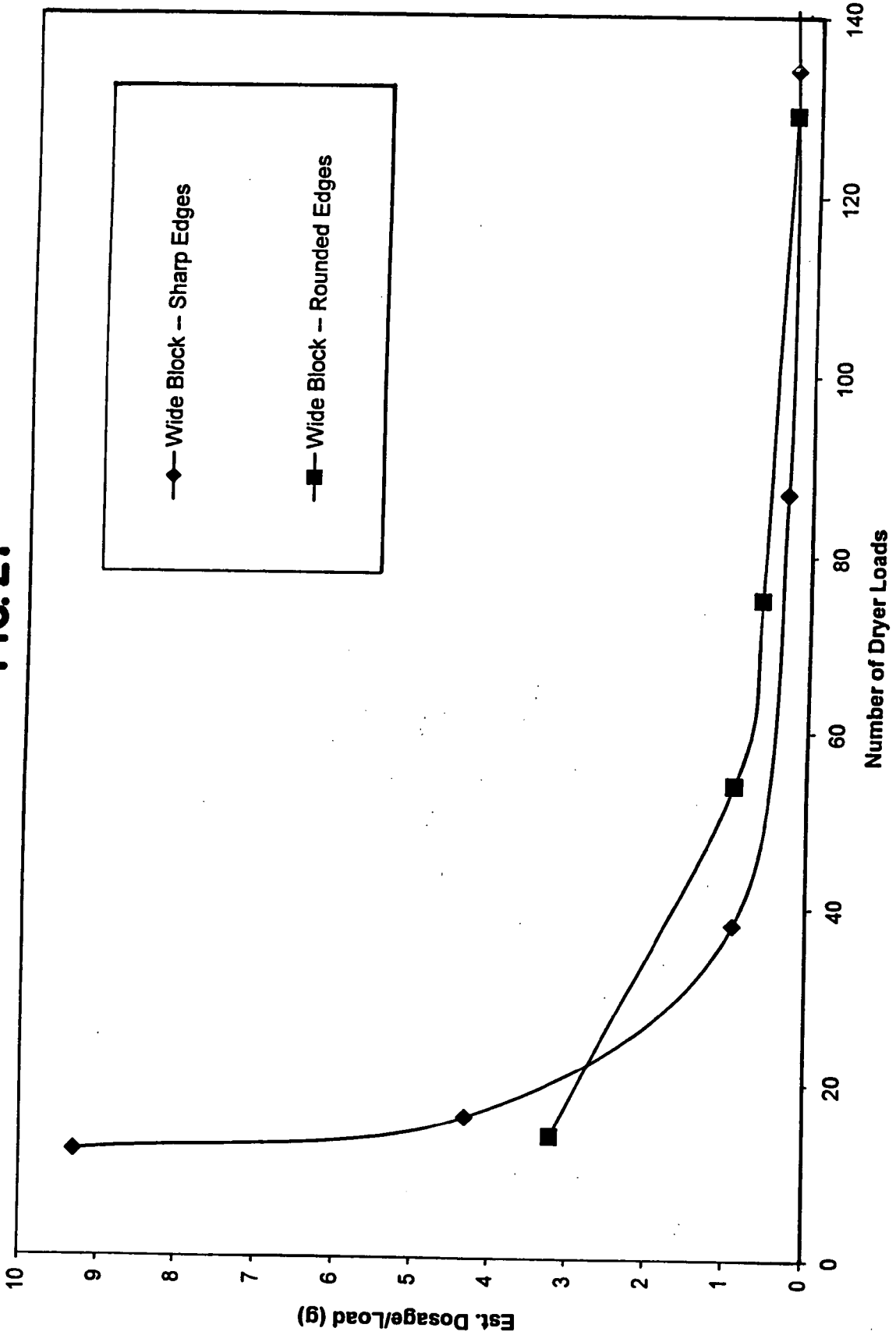

Narrow Block -- Sharp Edges
Narrow Block -- Rounded Edges
Est. Dosage/Load (g)
0
2
4
6
8
10
12
14
Number of Dryer Loads
0
10
20
30
40
50
60

FIG. 20

FIG. 21


Wide Block -- Sharp Edges
Wide Block -- Rounded Edges
Est. Dosage/Load (g)
Number of Dryer Loads
0
1
2
3
4
5
6
7
8
9
10
0
20
40
60
80
100
120
140

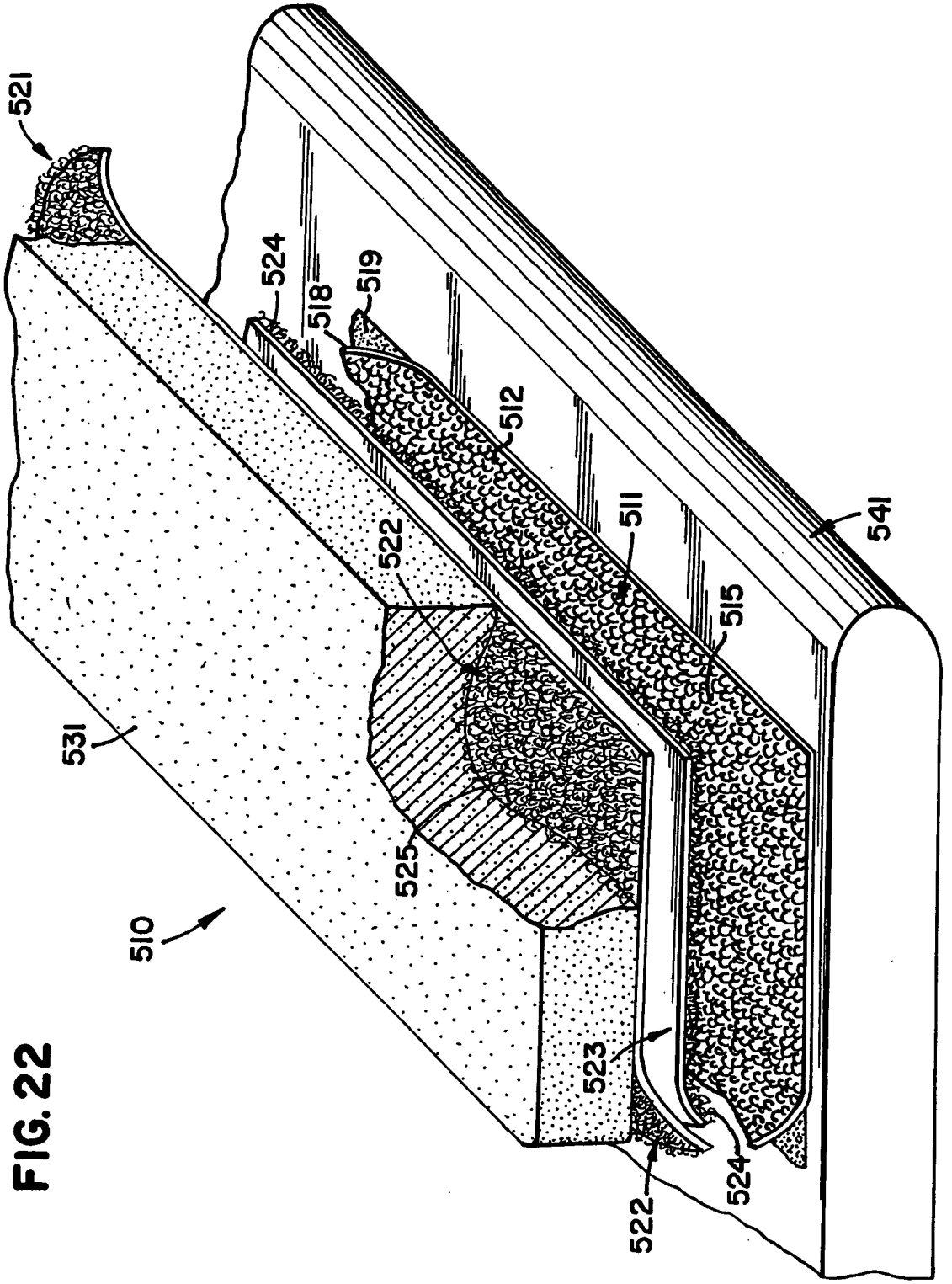


FIG. 22

PRODUCT DISPENSER AND CARRIER

[0001] This application is a continuation of U.S. application Ser. No. 10/121,440, filed Apr. 10, 2002.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a product dispenser and carrier, and more particularly, the present invention relates to a product dispenser and carrier for dispensing a solid fabric conditioner inside a dryer.

[0004] 2. Description of the Prior Art

[0005] Laundry additives are commonly applied to laundry via a liquid either prior to or during the wash cycle or via a treated sheet during the dryer cycle. Laundry may be pre-treated prior to the wash cycle, or the liquid additive mixes with the water during the wash cycle to contact the laundry. The treated sheet tumbles around in the dryer during the dryer cycle to contact the laundry. For best results, either another dose of the liquid or a new treated sheet must be applied each time. Although treated sheets may be used more than one time, they become much less effective with each subsequent cycle. Therefore, using a new treated sheet each time works best to have consistent, effective results on the laundry. In addition, other types of laundry products can be applied prior to placing the laundry in either the washer and/or the dryer. For example, pre-treatment products in either a liquid or a semi-solid form may be applied to the laundry. However, again these products must be applied to the laundry each time before the appropriate cycle.

SUMMARY OF THE INVENTION

[0006] In a preferred embodiment dispenser for attachment to a surface, a plate member has a front side, a back side, and an attachment member. A product carrier has a mating member, a first side, and a second side and is configured and arranged to engage the attachment member thereby releasably connecting the plate member and the product carrier, whereby the product carrier is replaceable. A connecting member is operatively connected to the back side of the plate member, and the connecting member operatively connects the plate member to the surface. A solid product is operatively connected to the product carrier, wherein a substantial portion of the solid product extends from the first side of the product carrier away from the plate member and the second side of the product carrier faces the plate member.

[0007] In other preferred embodiment dispenser for dispensing a fabric conditioner in a dryer, the dryer having an inner surface, a plate member has a front side and a back side.

[0008] The back side has means for operatively connecting the back side to the inner surface.

[0009] An attachment member is operatively connected to the plate member. A product carrier has a mating member, a first side, and a second side, and the mating member is configured and arranged to engage the attachment member thereby releasably connecting the plate member and the product carrier, which carries the fabric conditioner.

[0010] In another preferred embodiment product dispenser for attachment to a surface, a plate member includes a front side and a back side. An attachment member is operatively connected to the plate member. An adhesive is operatively connected to the back side of the plate member for connecting the plate member to the surface. A product carrier includes a mating member, a first side, and a second side. The mating member is configured and arranged to engage the attachment member thereby releasably connecting the plate member and the product carrier. The product carrier carries a solid product, wherein a substantial portion of the solid product extends from the first side away from the plate member and the second side faces the front side of the plate member.

[0011] In a preferred embodiment method for dispensing a product, a plate member is attached to a surface. The plate member has a front side, a back side, and an attachment member. The back side includes an adhesive for connecting the back side to the surface. A carrier is attached to the plate member. The carrier has a mating member, a first side and a second side. The mating member is configured and arranged to releasably engage the attachment member, and the carrier carries the product and is replaceable.

[0012] In another preferred embodiment method for dispensing a fabric conditioner in a dryer, the dryer having an inner surface, a plate member is attached to the inner surface of the dryer. The plate member has a front side, a back side, and an attachment member. The back side has an adhesive, which connects the back side to the inner surface of the dryer. A product carrier is then attached to the front side of the plate member. The product carrier has a mating member, a first side, and a second side. The mating member is configured and arranged to engage the attachment member thereby releasably connecting the plate member and the product carrier. The product carrier carries the fabric conditioner and is replaceable, wherein a substantial portion of the fabric conditioner extends from the first side of the product carrier away from the plate member and the second side of the product carrier faces the front side of the plate member. The fabric conditioner is allowed to become depleted after repeated use in the dryer, and the product carrier is then removed from the plate member. A second product carrier carrying a second fabric conditioner is then attached to the plate member.

[0013] In another preferred embodiment dispenser for mounting on a surface, a mount has a top side with a flange and a bottom side. A product carrier has a first side and a second side, and the second side has legs extending therefrom. The legs are configured and arranged to engage the flange thereby releasably connecting the product carrier to the mount. A solid product is operatively connected to the first side of the product carrier.

[0014] In another preferred embodiment dispensing device for attachment to a surface, a dispenser has a mount and a carrier. The mount is operatively connected to the surface and the carrier is operatively connected to the mount. A product is cast onto the carrier opposite the mount, and the product is disposed on the dispenser at an angle relative to the surface to which the dispenser is operatively connected.

[0015] In a preferred embodiment method of dispensing a fabric conditioner in a dryer, a fabric conditioner is cast onto a product carrier, and the fabric conditioner has rounded

edges. A plate member is attached to a fin of a dryer, and the product carrier is attached to the plate member. The dryer is allowed to run through a dryer cycle. A consistent, optimum dose of said fabric conditioner is dispensed from an initial cycle to a final cycle until said fabric conditioner has become depleted.

[0016] In a preferred embodiment dispenser for attachment to a surface, a plate member has a front side, a back side, and an attachment member. A product carrier has a mating member configured and arranged to engage the attachment member thereby releasably connecting the plate member and the product carrier, and the product carrier is replaceable. A solid product is operatively connected to the product carrier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] **FIG. 1** shows a product dispenser and carrier constructed according to the principles of the present invention attached to a dryer fin;

[0018] **FIG. 2** is a top perspective view of the product dispenser and carrier shown in **FIG. 1**;

[0019] **FIG. 3** is an exploded top perspective view of the product dispenser and carrier shown in **FIG. 1**;

[0020] **FIG. 4** is a top perspective view of a portion of the product carrier shown in **FIG. 3**;

[0021] **FIG. 5** is a top perspective view of the portion of the product carrier shown in **FIG. 4** with product on the product carrier;

[0022] **FIG. 6** is a bottom perspective view of a portion of the product carrier shown in **FIG. 3**;

[0023] **FIG. 7** is a bottom perspective view of the portion of the product carrier shown in **FIG. 6** with product on the product carrier and the product dispenser attached thereto;

[0024] **FIG. 8** is an exploded top perspective view of a product dispenser and carrier constructed according to the principles of the present invention;

[0025] **FIG. 9** is an end view of the product dispenser and carrier shown in **FIG. 8** attached to a dryer fin;

[0026] **FIG. 10** is an exploded top perspective view of a product dispenser and carrier constructed according to the principles of the present invention;

[0027] **FIG. 11***a* is an exploded bottom perspective view of a product dispenser and carrier constructed according to the principles of the present invention;

[0028] **FIG. 11***b* is an exploded side view of the product dispenser and carrier shown in **FIG. 11***a*;

[0029] **FIG. 12** is an exploded top perspective view of a product dispenser and carrier constructed according to the principles of the present invention;

[0030] **FIG. 13** is an exploded top perspective view of a product dispenser and carrier constructed according to the principles of the present invention;

[0031] **FIG. 14** is a bottom perspective view of the carrier shown in **FIG. 13** with a product operatively connected to half of the carrier;

[0032] **FIG. 15** is a cross sectional view of a solid product on the product carrier taken along the line **15-15** of **FIG. 14**;

[0033] **FIG. 16***a* is a side view of a solid product having a half-cylindrical narrow shape and a high dome;

[0034] **FIG. 16***b* is an end view of the solid product shown in **FIG. 16***a*;

[0035] **FIG. 17***a* is a side view of a solid product having a half-cylindrical narrow shape and a high dome with rounded top edges;

[0036] **FIG. 17***b* is an end view of the solid product shown in **FIG. 17***a*;

[0037] **FIG. 18***a* is a side view of a solid product having a half-cylindrical wide shape and a low dome;

[0038] **FIG. 18***b* is an end view of the solid product shown in **FIG. 18***a*;

[0039] **FIG. 19***a* is a side view of a solid product having a half-cylindrical wide shape and a low dome with rounded top edges;

[0040] **FIG. 19***b* is an end view of the solid product shown in **FIG. 19***a*;

[0041] **FIG. 20** is a graph showing the dispensing rates of the solid products shown in **FIGS. 16***a* and **17***a*;

[0042] **FIG. 21** is a graph showing the dispensing rates of the solid products shown in **FIGS. 18***a* and **19***a*; and

[0043] **FIG. 22** is an exploded side perspective view of a product dispenser and carrier constructed according to the principles of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0044] Product dispensers and carriers constructed according to the principles of the present invention are designated by the numerals **10**, **110**, **210**, **310**, **410**, and **510** in the drawings.

[0045] In one preferred embodiment, the product dispenser and carrier **10** includes a plate member **11** and a product carrier **21**, which carries a product **31**. An assembled product dispenser and carrier **10** is shown in **FIG. 2**, and an exploded view of the product dispenser and carrier **10** is shown in **FIG. 3**. Generally, the product carrier **21** is operatively connected to the plate member **11**, which may be attached to a surface such as a fin **41** of a dryer **40**, as shown in **FIG. 1**, to dispense the product **31** such as a solid fabric conditioner. Although the invention is described for use with fabric softeners, other products such as sanitizers, water repellants, deodorizers, bleaches, soil repellants, due-transfer inhibitors, fiber protecting polymers, fiber smoothers, UV light absorbers, anti-wrinkle agents, and etc. could also be used. Therefore, the present invention is not limited to use with fabric softeners.

[0046] The plate member **11** is rectangular in shape having dimensions of approximately 9⅜ inches long by 2⅜ inches wide by ¼ inch thick and is made of a high melt point plastic such as nylon or high impact polypropylene. It is recognized that other suitable high melt point plastics known in the art may also be used. The plate member **11** includes a front side **12** and a back side **18**. The front side **12** has a perimeter **13**,

which is surrounded by a rail member **14**. The rail member **14** protrudes slightly outward from the front side **12** and has rounded edges thereby creating a recessed area to accept and border the product carrier **21** within the rail member **14**. The front side **12** also includes an attachment member **15**, which in the preferred embodiment is a pair of hole plugs to provide releasable attachment means for operatively connecting the product carrier **21** to the plate member **11**. One hole plug is located on each end of the plate member **11** and is configured and arranged to accommodate holes in the product carrier **21**. The hole plugs are cylindrical and mushroom shaped with two slits at right angles to each other thereby dividing the hole plugs into four equal segments. The four segments allow the hole plugs to releasably engage the holes. As the hole plugs are pushed into the holes, the segments are brought closer together allowing the holes to snap down over the mushroom portion, which then protrudes from the holes and the segments are allowed to spread apart again thereby holding the product carrier **21** onto the plate member **11**. The hole plugs could also be square in shape with an arrow head and a slit dividing the hole plug in two segments parallel to the arrow head, as shown in **FIGS. 11***a* and **11***b*. To release the product carrier **21** from the hole plugs, the holes are brought over the mushroom portion of the hole plugs thereby bringing the segments together to allow the holes to pull over the mushroom portion and be released. The hole plugs may be molded as part of the plate member **11**. However, the hole plugs **15** may also be molded as part of the product carrier **21** and engage holes **24** in the plate member **11** as shown in **FIG. 10**. Alternatively, the hole plugs could be a purchased part such as those commercially available from ITW Fastex, part number 207-241141-00 rather than molding them as part of the plate member **11** or product carrier **21**. Although hole plugs and holes are shown in the preferred embodiment, it is understood that other attachment means such as snaps, VELCRO®, and other means known in the art may be used to connect the product carrier **21** to the plate member **11**. The plate member **11** also includes indentations **17**, which allow easy removal of the product carrier **21** when the product **31** has been depleted and the product carrier **21** must be replaced with a new product carrier, on each side near each end of the plate member **11**. The indentations are sized and arranged to make removal of the product carrier **21** easy with one's fingers. Also, the product carrier **21** may simply be removed if dispensing of the particular product is not desired.

[**0047**] The back side **18** of the plate member **11** includes an adhesive **19**, which is used to operatively connect the plate member **11** to a surface. The adhesive **19** in the preferred embodiment is a double-sided foam back tape manufactured by 3M, part number 4084, having a paper backing **20**. The paper backing **20** may be removed when it is desired to attach the plate member **11** to a surface. Again, it is understood that other connecting means may be used to operatively connect the plate member **11** to a surface such as using VELCRO®, screws, and other means well known in the art.

[**0048**] The product carrier **21** is also rectangular in shape and is configured and arranged to fit within the rail **14** of the plate member **11**. The product carrier **21** is approximately 9 inches long by 2 inches wide by ⅛ inch thick and is made of a high melt point plastic. The product carrier includes a first side **22** and a second side **23**, which are shown in **FIGS. 4 and 6**, respectively. The first side **22** faces outward from the plate member **11** while the second side **23** faces the front side **12** of the plate member **11**. A mating member **24**, which engages the attachment member **15**, is also included in the product carrier **21**. In the preferred embodiment, the mating member **24** is a pair of holes having diameters of approximately ⅜ inch, one hole located on each side of the product carrier **21** and configured and arranged to releasably engage each of the hole plugs in the plate member **11** as described above. The holes could also be oval in shape to accommodate either round or square hole plugs, as shown in **FIG. 11***a*, and the oval shape would ensure that the hole plugs would fit should any shrinkage of the holes occur from exposure to the heat of the dryer. A plurality of apertures **25** approximately ⅜ inch in diameter are arranged on the product carrier, and in the preferred embodiment, the plurality of apertures **25** are hexagon shaped and are arranged in a nonlinear, honeycomb fashion. This nonlinear, honeycomb arrangement of the apertures **25** strengthens the product carrier **21** and prevents the product **31** from breaking and shearing from the product carrier **21**. In addition, the apertures **25** are countersunk or back beveled on the second side **23** to form a rivet like structure when the product **31** is applied to the product carrier **21**. The countersunk portion **26** of apertures **25** allows the product **31** to be securely attached to the product carrier **21**, and this is described more fully below. The product carrier **21** containing product **31** is disposable and replaceable once the product **31** has been depleted on the product carrier **21**.

[**0049**] The product **31** is preferably a solid product that is cast or extruded onto the first side **22** of the product carrier **21**, as shown in **FIG. 5**. However, the product **31** could also be glued, attached with VELCRO®, or otherwise operatively connected by means well known in the art to the product carrier **21**. As the product **31** is being cast or extruded onto the first side **22** of the product carrier **21**, the product **31** fills in the apertures **25**, and the countersunk portions **26** of apertures **25** allow the product **31** to fan or spread out proximate the second side **23** of the product carrier **21**. When the product **31** solidifies onto the product carrier **21**, this fanning or spreading out of the product **31** in the countersunk portions **26** proximate the second side **23** holds the product **31** onto the first side **22** of the product carrier **21**, as shown in **FIG. 7**. A substantial portion of the product **31** extends from the first side **22** of the product carrier **21** away from the plate member **11** and the second side **23** of the product carrier **21** faces the front side **12** of the plate member **11**. The substantial portion being at least about 85% of the product **31** on the side of the carrier **21** from which the product **31** is dispensed. The product **31** extends approximately ¾ inch from the first side **22** of the product carrier **21**. The preferred embodiment utilizes a solid fabric softener as the product **31** that is fixedly cast or extruded onto the product carrier **21**. The solid fabric softener is described in U.S. patent application Ser. No. _____ (Merchant & Gould Docket Number 163.1453US01), filed on even date herewith, entitled Fabric Softener Composition and Methods for Manufacturing and Using, which is incorporated by reference herein.

[**0050**] In operation, the paper **20** is peeled from the adhesive **19** operatively connected to the back side **18** of the plate member **11**, and the adhesive **19** is applied to a surface such as a dryer fin **41** thereby operatively connecting the plate member **11** to the surface. Then, the product carrier **21**

carrying product **31** is attached to the plate member **11**. The attachment member **15** of the plate member **11** is configured and arranged to engage the mating member **24** of the product carrier **21**. In the preferred embodiment, the attachment member **15** is a pair of holes on each side of the plate member **11** and the mating member **24** is a pair of hole plugs on each side of the product carrier **21** configured and arranged to releasably engage the holes. As described above, the hole plugs snap into the holes. When the product carrier **21** is attached to the plate member **11**, the rail member **14** of the plate member **11** surrounds the edges and corners of the product carrier **21** thereby preventing items from getting caught or snagged on the edges and corners of the product carrier **21**. The product **31** is then ready for dispensing. Only a small portion of the product **31** is depleted during each use. In the preferred embodiment fabric softener, approximately 1 to 3 grams of product is dispensed per cycle. Therefore, the product carrier **21** carrying the product **31** can be used for several applications. However, this amount of product will vary depending upon the type of product being dispensed, the chemical composition of the product, the size of the product, the size of the dryer, etc. Ideally, a consistent, optimum dose will be dispensed from the first cycle to the last cycle resulting in a relatively even dispense curve, as shown in **FIGS. 20 and 21**. When the product **31** becomes depleted, the empty product carrier **21** can be replaced with a second product carrier carrying product, and the empty product carrier **21** can be thrown away. Alternatively, the product carrier **21** could be removed if dispensing of the product **31** is not desired.

[**0051**] In another preferred embodiment, shown in **FIGS. 8 and 9**, the product dispenser and carrier **110** includes a mount **111** and a product carrier **121**. The mount **111** is made of a high melt point plastic and is generally wedge shaped having dimensions of approximately 9⅜ inches long by 2⅜ inches wide and the first end **116** is ¼ inch thick and the second end **117** is ⅜ inch thick. Therefore, an end view of the mount **111** resembles a generally triangular shape with one side being thicker than the other, opposing side, forming an angle of approximately 10 degrees. The angle may vary depending upon the product to be dispensed to maximize the even dispensing of the product. The front side **112** includes an attachment member **115**, which is a flange, proximate the first end **116** and the second end **117**. The back side **118** includes an adhesive **119**, similar to the adhesive **19** of the previously mentioned preferred embodiment, with paper backing **120**.

[**0052**] The product carrier **121** has a first side **122**, a second side **123**, a first end **116**, and a second end **117**. Also made of a high melt point plastic, the dimensions of the product carrier are approximately 9⅜ inches long by 2⅜ inches wide by 3/16 inch thick. It is recognized that the dimensions are for illustrative purposes only and any dimensions suitable for the intended purpose are acceptable. The product carrier **121** is an extruded plastic part with dove tail grooves along the length of the product carrier **121** on the first side **122**. The dove tail grooves **125** are approximately ⅛ inch deep. The dove tail grooves **125** hold the product **131** onto the first side **122** of the product carrier **121**, in a similar fashion as the countersunk portions **26** hold the product **31** onto the product carrier **21**. Also included on the product carrier **121** is mating member **124**, which is a leg extending from each of the edges running along the length of the product carrier **121** to engage the flange **115** of the mount **111**. The legs can either snap onto the flanges or the product carrier **121** may be slid onto the mount **111** to operatively connect the components. The product **131** is similarly cast or extruded onto the first side **122** of the product carrier **121** and held in place by the dove tail grooves **125**. Because the mount **111** is wedge shaped, the product **131** is disposed at an angle relative to the surface upon which the mount **111** is operatively connected to maximize the amount of product **131** dispensed and to ensure that the product **131** is dispensed evenly.

[**0053**] In operation, the paper is peeled from the adhesive **119** operatively connected to the bottom side **118** of the mount **111**, and the adhesive **119** is applied to a surface such as a dryer fin **141** thereby operatively connecting the mount **111** to the surface. Then, the product carrier **121** carrying product **131** is attached to the mount **111**. The attachment member **115** of the mount **111** is configured and arranged to engage the mating member **124** of the product carrier **121**. In the preferred embodiment, the attachment member **115** is a flange on each end **116** and **117** of the mount **111** and the mating member **124** is a pair of legs on each side of the product carrier **121** configured and arranged to releasably engage the flanges. The product carrier **121** may be either snapped onto the mount **111** so the legs engage the flanges or the product carrier **121** may be slid onto the mount **111** from the end of the mount **111**. The product **131** is then ready for dispensing. The wedge shape of the mount **111** allows the product **131** to be more evenly dispensed because the product **131** is angled toward the center of the dryer **140** thereby exposing a greater surface area of the product **131** to the laundry contained within the dryer **140**. Again, only a small portion of the product **131** is depleted during each use. Therefore, the product carrier **121** carrying the product **131** can be used for several applications. When the product **131** becomes depleted, the empty product carrier **121** can be replaced with a second product carrier carrying product, and the empty product carrier **121** can be thrown away. Again, the product carrier **121** could be removed if dispensing of the product **131** is not desired.

[**0054**] In another preferred embodiment product dispenser and carrier **210**, shown in **FIGS. 11***a* and **11***b*, the dispenser **211** includes an attachment member **215**, which is a pair of oval shaped holes. The oval shaped holes ensure that the corresponding hole plugs, whether round or square, fit within the holes even if shrinkage of the holes during casting of the product (approximately up to 300° F.) or from the dryer heat (approximately up to 250° F.) should occur. The dispenser **211** also includes a front **212**, a back **218**, and a perimeter **213**. The perimeter **213** of the dispenser **211** includes a rail portion **214** extending outward from the front **212** and an indentation **217**. The rail portion **214** borders the carrier **221** and protects the edges of the carrier **221** when operatively connected to the front **212** of the dispenser **211**. The indentation **217** provides easy access to a portion of the edges of carrier **221** when detachment from the dispenser **211** is desired. An adhesive, not shown, may be attached to the back **218** of the dispenser **211** for attaching the dispenser **211** to a surface.

[**0055**] The carrier **221** includes a first side **222**, a second side **223**, and a mating member **224**. The first side **222** is the side onto which a solid product is cast or extruded, and the solid product extends outward from the first side **222**. The first side **222** is dome shaped so that when the solid product

is mounted thereto the solid product will take on a dome shape as well. In addition, the dome shape of the first side **222** creates deeper countersunk portions (not shown) proximate the second side **223** thereby allowing the product to attach more securely to the carrier **221**. The dome shape also improves the dispense rate of the product and assists in more even dispensing of the product. Although not shown, the carrier **221** includes a plurality of apertures similar to those shown in **FIGS. 13 and 14**. This arrangement of the plurality of apertures allows the product to spread out from the first side **222** toward proximate the second side **223** thereby preventing the solid product from detaching from the carrier **221**. The mating member **224** is a pair of square shaped hole plugs with arrow shaped ends and a slit parallel with the edges forming the arrow shaped ends. The mating member **224** corresponds with the holes in the dispenser **211**. Because the hole plugs are square rather than round, there is more surface area engaging the holes thereby maximizing the grip. The hole plugs simply snap into the holes to releasably attach the carrier **221** to the dispenser **211**.

[**0056**] **FIG. 12** shows another preferred embodiment of the present invention. Rather than having an attachment member and a mating member that snap into one another, the product dispenser and carrier **310** includes a carrier **321** that slides into a dispenser **311**. The carrier **321** itself acts as the mating member in this embodiment. The dispenser **311** has a front **312**, a back **318**, and a perimeter **313**. The back **318** provides a surface on which an adhesive or other securing member may be attached to mount the product dispenser and carrier **310** onto a surface. The perimeter **313** of the dispenser **311** includes a rail portion **314** extending outward from the front **312** along three sides of the dispenser **311**. The rail portion **314** borders the carrier **321** along three sides and protects the three edges of the carrier **321** when operatively connected to the front **312** of the dispenser **311**. An attachment member includes lips **315***a* and a securing tab **315***b*. The lips **315***a* extend inward from the rail portion **314** to engage the three edges of the carrier **321** thereby preventing the carrier **321** from detaching from the dispenser **311**. The securing tab **315***b* is on the fourth side of the dispenser **311** not having a rail portion. When the carrier **321** is slid into the dispenser **311** from the fourth side, the securing tab **315***b* is pushed downward and then snaps into place to border the corresponding edge of the carrier **321** when in place on the front **312** of the dispenser **311**. Therefore, securing tab **315***b* provides a snap fit to hold the carrier **321** onto the dispenser **311**. To disengage the carrier **321** from the dispenser **311**, the securing tab **315***b* is pushed downward and then the carrier **321** is slid away from the dispenser **311** from the fourth side.

[**0057**] The second side **323** of the carrier **321** faces the front **312** of the dispenser **311** and the first side **322** of the carrier **321** is the side from which the product extends. Again, the first side **322** is dome shaped so that when the solid product is mounted thereto the solid product will take on a dome shape with rounded top edges as well. Again, this dome shape improves the dispensing rate of the product and assists in more even dispensing of the product. Although not shown, the carrier **321** includes a plurality of apertures similar to those shown in **FIGS. 13 and 14**. This arrangement of the plurality of apertures allows the product to spread out from the first side **322** toward proximate the second side **323** thereby preventing the solid product from detaching from the carrier **321**.

[**0058**] **FIG. 13** is another embodiment of the present invention similar to that shown in **FIG. 12** but rather than sliding into the dispenser **411** from the side, the carrier **421** slides in from an end. The product dispenser and carrier **410** includes a dispenser **411** and a carrier **421**. The dispenser **411** has a front **412**, a back **418**, and a perimeter **413**. The back **418** provides a surface onto which an adhesive or other attachment member may be attached to mount the dispenser **411** onto a surface. The perimeter **413** of the dispenser **411** includes a rail portion **414** extending outward from the front **412** along three sides of the dispenser **411**, leaving an end without a rail portion. The rail portion **414** borders the carrier **421** along three sides and protects the corresponding three edges of the carrier **421** when operatively connected to the front **412** of the dispenser **411**. An attachment member includes lips **415***a* and a securing tab **415***b*. The lips **415***a* extend from the rail portion **414** along the two sides, and in the preferred embodiment, there are three lips **415***a* on each side, the three lips **415***a* being aligned with the opposing three lips **415***a*. It is recognized, however, that any arrangement of lips **415***a* is possible as long as the mating members **424** on the carrier **421** are properly aligned. The securing tab **415***b* is on the end of the dispenser **411** not having a rail portion. When the carrier **421** is slid into the dispenser **411** from either the end or as described below, the securing tab **415***b* is pushed downward and then snaps into place to border the corresponding edge of the carrier **421** when in place on the front **412** of the dispenser **411**.

[**0059**] The carrier **421** has a first side **422**, a second side **423**, and mating members **424**. The mating members **424** are lips extending from the side edges of the carrier **421** and are arranged similarly as the lips **415***a* on the dispenser **411**. Therefore, the carrier **421** does not have to be slid into the dispenser **411** all the way from an end of the carrier **421**. Rather, the mating members **424** are simply placed in the spaces between the lips **415***a* thereby depressing the securing tab **415***b* concurrently. As the carrier **421** is slid into the dispenser **411** so that the lips **415***a* align with the mating members **424**, the securing tab **415***b* engages the end of the carrier **421** thereby snap locking it into place. This provides a shorter distance to connect the carrier **421** to the dispenser **411** should the walls of the dryer prevent the carrier **421** from being slid into place from the end of the dispenser **411**. To disengage the carrier **421** from the dispenser **411**, the securing tab **415***b* is pushed downward and then the carrier **421** is slid away from the lips **415***a* of the dispenser **411**. When the mating members **424** of the carrier **421** no longer align with the lips **415***a* of the dispenser **411**, the carrier **421** may be removed from the dispenser **411**.

[**0060**] The carrier **421** also includes a plurality of apertures **425** and countersunk portions **426**, as previously described. **FIG. 14** is a bottom perspective view of the carrier **421** shown in **FIG. 13**. For illustrative purposes, product **431** is only shown on half of the carrier **421** to show both the bottom structure of the carrier **421** and how the product **431** is supported below the carrier **421**. As shown in **FIG. 14**, the carrier **421** includes a straight rib **430***a* along the center parallel to the sides of the carrier **421** and a zig-zag rib **430***b* on each side of the straight rib **430***a* approximately half-way to the sides of the carrier **421**. There is a major portion of the product **431** on the top of the carrier **421** to be dispensed during the dryer cycle. There is a minor portion of the product **431** inside the carrier **421** and extending into the countersunk portions **426** and in between

the ribs **430***a* and **430***b* of the carrier **421**, as shown in **FIG. 14**. Therefore, the major portion of the product is joined on top of the carrier **421** and the minor portion of the product is joined below the carrier **421** between the ribs **430***a* and **430***b*. This assists in keeping the product on the carrier **421**. Optionally, the carrier **421** may also include a cover (not shown) attached to the second side **423** and creating a gap between the second side **423** and the cover where the product joins below the carrier **421**. With a cover, the product **431** would contact the cover between the ribs **430***a* and **430***b*. This assists in casting the product vertically onto the carrier **421** and the product is more evenly applied to the carrier **421**. When casting the product onto the carrier **421** horizontally, the cover is not needed for even application of the product. Also, the cover protects the solid product that has gone through the apertures and countersunk portions so the only part of the product that is exposed is the portion extending from the first side **422** of the carrier **421**. Therefore, the product can extend past the countersunk portions **426** and reconnect/join along the surface of the cover to provide additional assurance that the product will not separate from the carrier **421**. The line **15-15** in **FIG. 14** shows the line across which the cross sectional view of **FIG. 15** is taken. **FIG. 15** is a cross sectional view showing a solid product **431** on the carrier **421** shown in **FIGS. 13 and 14**. Although **FIG. 14** shows product **431** on only half of the carrier **421**, **FIG. 15** shows product on the entire carrier **421**. This further shows how the product **431** connects both above and below the carrier **421** for added security of the product **431** on the carrier **421**.

[**0061**] In addition, the product could also be mounted, cast, or otherwise attached by means well known in the art onto VELCRO®, 3M™ Scotchmate™, 3M™ Dual Lock™, or any other suitable hook and loop or reclosable fastener type device. **FIG. 22** shows a preferred embodiment product dispenser and carrier **510** utilizing hook and loop. The product dispenser and carrier **510** includes a dispenser or plate member **511** and a carrier **521**. The dispenser **511** is a piece of loop having a front **512** with an attachment member **515** and a back **518** with an adhesive or connecting member **519**. The adhesive **519** operatively connects the dispenser **511** onto a surface such as a dryer fin **541**. The carrier **521** includes a first side or layer **522** and a second side or layer **523**. The first and second sides **522** and **523** are each pieces of hook, and the adhesives attached to the back of each piece (not shown) are pressed together so that the hook portions are opposing. The first side **522** has hook **525** and the second side **523** has hook or mating member **524**. The product **531** is attached to the hook **525** while the mating member **524** engages the attachment member **515**. Therefore, the carrier **521** readily attaches to and detaches from the dispenser **511** as easily as the interaction between the hook **524** and the loop **515**. When the product **531** has become depleted, the carrier **521** is simply detached from the dispenser **511** by disengaging the hook **524** and the loop **515** and then another carrier carrying product is substituted therefor.

[**0062**] It was found that the shape of the product affects the dispensing rate of the product. The dispense curves of the product dose per dryer cycle as a function of the number of dryer cycles were compared for four different sizes and shapes of solid product. Each solid product was 8 inches long. The dispenser and carriers were mounted in the center on the front portion of the fin of a 75 pound dryer. The front portion of the fin is the portion that touches the laundry. The first product having a half-cylindrical narrow shape (1.75 inches wide) and a high dome (1.00 inch high) is shown in **FIGS. 16***a* and **16***b*. **FIG. 16***a* is a side view of the product and **FIG. 16***b* is an end view of the product shown in **FIG. 16***a*. The second product having a half-cylindrical narrow shape (1.75 inches wide) and a high dome (1.00 inch high) with rounded top edges is shown in **FIGS. 17***a* and **17***b*. **FIG. 17***a* is a side view of the product and **FIG. 17***b* is an end view of the product shown in **FIG. 17***a*. The third product having a half-cylindrical wide shape (2.50 inches wide) and a low dome (0.65 inch high) is shown in **FIGS. 18***a* and **18***b*. **FIG. 18***a* is a side view of the product and **FIG. 18***b* is an end view of the product shown in **FIG. 18***a*. The fourth product having a half-cylindrical wide shape (2.50 inches wide) and a low dome (0.65 inch high) with rounded top edges is shown in **FIGS. 19***a* and **19***b*. **FIG. 19***a* is a side view of the product and **FIG. 19***b* is an end view of the product shown in **FIG. 19***a*.

[**0063**] The wide, low dome products (third and fourth products) shown in **FIG. 21** dispensed the product more slowly than the narrow, high dome products (first and second products) shown in **FIG. 20**. The initial doses were approximately 9 grams and 3.5 grams per dryer cycle (third and fourth products, respectively) versus approximately 13 grams and 5 grams per dryer cycle (first and second products, respectively). The products with the rounded top edges (second and fourth products) dispensed the product more evenly from the first to the last cycle as compared to the products with squared/sharp edges (first and third products). In other words, the high initial doses observed with squared/sharp edges (first and third products) were avoided by rounding the edges (second and fourth products). These high initial doses are most likely due to the wet laundry sliding over the square/sharp edges at both ends of the half-cylindrical product thereby slowly wearing the edges until a rounded edge is formed. The optimum shape for even dispensing of the product was obtained by using a half-cylindrical block of product with squared/sharp edges that were rounded after approximately 20 dryer cycles. Therefore, starting with a shape having rounded edges or rounded surfaces, which results from using a block of product with squared/sharp edges that were rounded after approximately 20 dryer cycles, provides an optimum shape for dispensing a consistent, optimum dose of product. The optimum shape helped reduce high product doses in the initial doses. As shown in **FIGS. 20 and 21**, the most even dispensing was achieved with the wide product block with rounded edges (fourth product).

[**0064**] **FIG. 20** is a graph showing the dispensing rates of the solid products shown in **FIGS. 16***a* and **17***a*, and **FIG. 21** is a graph showing the dispensing rates of the solid products shown in **FIGS. 18***a* and **19***a*. These graphs show that products having rounded edges have more even dispense curves from the first dose to the final dose. The products having the sharp edges begin with much higher initial doses than products having rounded edges. Therefore, to ensure that a consistent, optimum dose is achieved for each cycle, a product with rounded edges should be used.

[**0065**] The amount of product dispensed is also moisture controlled. In other words, every time the wet or damp laundry tumbling around in the dryer contacts the product, minute amounts of the product are dissolved by the adsorbed water in the laundry. This is due to the low water solubility

of the product and also due to the friction (mechanical action) of the laundry rubbing against the product. Once the laundry is dry, product will no longer be dispensed. In the preferred embodiment, the product is sized to deliver doses for multiple cycles (100+). Ideally, the dose should not change significantly from the first to the last dryer cycle. For example, if a dose of 1 gram per cycle provides the desired effect on the laundry, a block of 100 grams should last for 100 cycles, dispensing approximately 1 gram per cycle. Generally, the product will last for multiple cycles (100+) in a dryer and dispense approximately the same dose of product from the first to the last cycle.

[0066] However, experiments have shown that dispense curves are not even from the first to the last cycle because of the changes in volume, surface area, and shape of the product over time. The changes in the volume and the surface area, which inevitably decrease with each dose, cause the dispensed dose to decrease slowly from the first to the last cycle because there is less contact with the laundry and the product. The shape of the product is also a factor for the initial doses of the product. If the product is cast in the shape of a rectangular block, the contact between the tumbling laundry and the block will cause the sharp edges of the block to become smooth or round by friction during the initial cycles. This causes substantially higher dispense doses in the initial dryer cycles until the edges are smooth or round and the block resembles a half-cylinder with round ends (oval in shape).

[0067] In addition, the amount of product that is dispensed can also be affected by the location, the position, and the orientation of the product in the dryer. The product can be placed on either side of the fin or even on the door of the dryer. In addition, it was found that placement of the dispenser and carrier on the fin also affects the dispensing rate of the product. In other words, placing the dispenser and carrier on the side of the fin that touches the laundry would increase the dispensing rate of the product. Conversely, placing the dispenser and carrier on the side opposite the side of the fin that touches the laundry would decrease the dispensing rate of the product. Position on the fin such as in the center of the fin or near the edge of the fin will also affect the dose. In addition, if the product is mounted at an angle relative to the surface of the fin, as shown in **FIG. 9**, more product is exposed to the laundry thereby dispensing more product.

[0068] It is understood that any of these features may be interchanged among the different preferred embodiments to create variations thereof and such variations are within the scope of the present invention. It is also understood that the plate member and the product carrier may be made in numerous different shapes and sizes and are not limited to being rectangular in shape, as shown in the preferred embodiment. Further, it is recognized that the dimensions described herein are for illustrative purposes only and any dimensions suitable for the intended purpose are acceptable. In addition, it is also understood that the product dispenser and carrier may be used on the dryer door or it may even be used in different applications such as pest elimination and dish washing to dispense products such as insect bait and drying agents, respectively. Also, the types of products that could be used with this device are softeners, sanitizers, water repellants, deodorizers, bleaches, soil repellants, dye-transfer inhibitors, fiber protecting polymers, fiber smoothers, UV light absorbers, anti-wrinkle agents, etc. Any of these products could be used with the present invention.

[0069] The above specification, examples and data provide a complete description of the manufacture and use of the composition of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

We claim:

1. A dispenser for attachment to a surface, comprising:

a. a plate member having a front side, a back side, and an attachment member;

b. a product carrier, said product carrier having a mating member, a first side, and a second side, said mating member being configured and arranged to engage said attachment member thereby releasably connecting said plate member and said product carrier, whereby said product carrier is replaceable;

c. a connecting member operatively connected to said back side of said plate member, said connecting member operatively connecting said plate member to the surface; and

d. a solid product operatively connected to said product carrier, wherein a substantial portion of said solid product extends from said first side of said product carrier away from said plate member and said second side of said product carrier faces said plate member.

2. The dispenser of claim 1, wherein said first side of said product carrier is dome-like shaped.

3. The dispenser of claim 1, wherein said solid product has rounded top edges thereby having a dome-like shape.

4. The dispenser of claim 1, wherein said solid product is extruded onto said product carrier.

5. The dispenser of claim 1, wherein said solid product is cast onto said product carrier.

6. The dispenser of claim 1, further comprising a plurality of apertures in said product carrier, said plurality of apertures being countersunk on said second side of said product carrier, wherein said plurality of apertures allow said solid product to be fixedly cast onto said product carrier.

7. The dispenser of claim 6, wherein said plurality of apertures are disposed on said product carrier in a nonlinear arrangement.

8. The dispenser of claim 6, wherein said plurality of apertures are hexagon shaped.

9. The dispenser of claim 1, further comprising dove tail shaped grooves disposed along said product carrier.

10. The dispenser of claim 1, wherein said attachment member is a hole plug and said mating member is a hole configured and arranged to releasably engage said hole plug.

11. The dispenser of claim 1, wherein said attachment member is a hole and said mating member is a hole plug configured and arranged to releasably engage said hole.

12. The dispenser of claim 1, wherein said attachment member is lips and a securing tab and said mating member is said product carrier, said product carrier being engaged by said lips and said securing tab to secure said product carrier thereto.

13. The dispenser of claim 1, wherein said attachment member is first lips and a securing tab and said mating member is second lips.

14. The dispenser of claim 1, wherein said attachment member is loop and said mating member is hook.

15. The dispenser of claim 1, wherein said solid product is supported at an angle relative to the surface.

16. The dispenser of claim 15, wherein said plate member is wedge shaped thereby supporting said product carrier at an angle relative to the surface.

17. The dispenser of claim 15, wherein said product carrier is wedge shaped thereby supporting said solid product at an angle relative to the surface.

18. A product dispenser for attachment to a surface, comprising:

a. a solid product;

b. a plate member, said plate member including a front side and a back side;

c. an attachment member operatively connected to said plate member;

d. an adhesive, said adhesive operatively connected to said back side of said plate member for connecting said plate member to the surface; and

e. a product carrier, said product carrier including a mating member, a first side, and a second side, said mating member being configured and arranged to engage said attachment member thereby releasably connecting said plate member and said product carrier, said product carrier carrying said solid product, wherein a substantial portion of said solid product extends from said first side away from said plate member and said second side faces said front side of said plate member.

19. The dispenser of claim 18, wherein said plate member further comprises a rail and a perimeter, said rail extending from said perimeter along said front side of said plate member, wherein said rail borders said product carrier when releasably engaged thereto.

20. The dispenser of claim 18, wherein said product carrier is disposable and may be replaced with a second product carrier carrying a second solid product once said solid product has been depleted on said product carrier.

21. The dispenser of claim 18, wherein said attachment member is lips and a securing tab and said mating member is said product carrier, said product carrier being engaged by said lips and said securing tab to secure said product carrier thereto.

22. The dispenser of claim 18, wherein said attachment member is first lips and a securing tab and said mating member is second lips.

23. The dispenser of claim 18, wherein said attachment member is loop and said mating member is hook.

24. A dispenser for mounting on a surface, comprising:

a. a mount having a top side and a bottom side, said top side having a flange;

b. a product carrier having a first side and a second side, said second side having legs extending therefrom, said legs being configured and arranged to engage said flange thereby releasably connecting said product carrier to said mount; and

c. a solid product operatively connected to said first side of said product carrier.

25. The dispenser of claim 24, further comprising dove tail grooves along said first side of said product carrier, wherein said solid product is cast onto said first side and product fills in said dove tail grooves thereby holding said solid product onto said product carrier.

26. The dispenser of claim 24, further comprising apertures having a countersunk portion in said product carrier, wherein said countersunk portion is on said second side of said product carrier, and wherein said solid product is cast onto said first side and product fills in said countersunk portion thereby holding said solid product onto said product carrier.

27. The dispenser of claim 24, wherein said mount is wedge shaped thereby presenting said solid product at an angle relative to the surface.

28. The dispenser of claim 24, wherein said product carrier is wedge shaped thereby presenting said solid product at an angle relative to the surface.

29. A dispenser for attachment to a surface, comprising:

a. a plate member having a front side, a back side, and an attachment member;

b. a product carrier, said product carrier having a mating member configured and arranged to engage said attachment member thereby releasably connecting said plate member and said product carrier, whereby said product carrier is replaceable; and

c. a solid product operatively connected to said product carrier.

30. The dispenser of claim 29, wherein said attachment member is a hole plug and said mating member is a hole configured and arranged to releasably engage said hole plug.

31. The dispenser of claim 29, wherein said attachment member is a hole and said mating member is a hole plug configured and arranged to releasably engage said hole.

32. The dispenser of claim 29, wherein said attachment member is lips and a securing tab and said mating member is said product carrier, said product carrier being engaged by said lips and said securing tab to secure said product carrier thereto.

33. The dispenser of claim 29, wherein said attachment member is first lips and a securing tab and said mating member is second lips.

34. The dispenser of claim 29, wherein said attachment member is a flange and said mating member is legs, said legs engaging said flange to releasably secure said product carrier to said plate member.

35. The dispenser of claim 29, wherein said attachment member is loop and said mating member is hook.

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